CLAIMS

1. A monitor for monitoring at least one optical signal parameter in an optical fibre having an access region of reduced cladding sufficient to allow access to the evanescent field, the monitor comprising an optical element mountable adjacent to the access region of an optical fibre which optical element is capable of obtaining access to the evanescent field to enable use of the data therein to derive the at least one optical signal parameter.

2. A monitor for monitoring the optical signal parameters in an optical fibre comprising a fibre having an access region of reduced cladding sufficient to allow access to the evanescent field of the optical fibre and an optical element mounted adjacent to the access region to obtain access to the evanescent field so as to enable use to be made of the data therein.

3. A monitor as claimed in Claim 1 or Claim 2 wherein the fibre is a single made fibre.

4. A monitor as claimed in Claim 1 or Claim 2 wherein the fibre is a multimode fibre.

5. A monitor as claimed in Claim 1 or Claim 2 wherein the fibre is a polarisation maintaining fibre.

6. A monitor as claimed in Claim 1 to 5, wherein the optical element is a photo detector arranged to access the evanescent field and produce an electrical signal related thereto.

7. A monitor as claimed in Claim 6, wherein means are provided for maintaining the photo detector and the access region in a fixed relationship.

8. A monitor as claimed in Claim 6 or 7, wherein the photo detector is in contact with the access region of the fibre.

9. A monitor as claimed in Claim 6 or 7, wherein a lens is interposed between the access region and the photo detector.

10. A monitor as claimed in Claim 7 or 9, wherein a polariser is interposed between the access region and the photo detector.

11. A monitor as claimed in Claim 10, wherein a plurality of photo detectors are provided, each with a different polariser for detecting different polarising fields.

12. A monitor as claimed in Claim 7 or 9, wherein a wavelength filter is interposed between the access region and the photo detector.

13. A monitor as claimed in Claim 11, wherein a plurality of photo detectors are provided, each with a different wavelength filter for detecting different wavelengths.

14. A monitor as claimed in any one of Claims 6 to 13, wherein an array of photo detectors are provided with an array of elements between the detector array and the fibre, the elements being selected from one or more of polarisers and wavelength filters.

15. A monitor as claimed in any preceding claim wherein a plurality of fibres are arranged in parallel and have aligned access areas and a photo detector array spans all of the access regions.

16. A monitor as claimed in Claim 1,2, 4, or 5, wherein the optical

element comprises a second optical fibre, one end of which is located adjacent to the access region for capturing light output from the evanescent field.

17. A monitor as claimed in Claim 16, wherein a lens is interposed between the access region and the end of the second fibre.

18. A channel monitor for a multi-channel optical fibre comprising means for splitting an input fibre into a plurality of fibres each having mutually aligned access regions and each carrying a smaller number of channels than the multi-channel fibre, an array of photo detectors spanning the access regions of the said plurality of fibres, and means for combining the plurality of fibres into a single output fibre.

19. A monitor according to Claim 18 wherein the multi-channel fibre is a single mode fibre.

20. A monitor according to Claim 18 wherein the multi-channel fibre is a multimode fibre.

21. A monitor according to Claim 18 wherein the multi-channel fibre is a polarisation maintaining fibre.

22. A channel monitor as claimed in any one of Claims 18 to 21 wherein each of the plurality of fibres carries a single channel.

23. A control arrangement for controlling a signal in an optical fibre comprising a monitor as claimed in any one of the Claims 1 to 22 and a controller responsive to the at least one optical signal parameter to alter at least one parameter of the signal.

24. A control arrangement as claimed in Claim 23 wherein the monitor is

arranged before the controller when viewed in the direction of the passage of an optical signal.

25. A control arrangement as claimed in Claim 23 wherein the monitor is arranged after the controller when viewed in the direction of the passage of an optical signal to provide closed-loop control.

26. A control arrangement as claimed in any one of the Claims 23 to 25 wherein the controller is arranged to alter at least the power of the signal.

27. A control arrangement for controlling the power in an optical fibre comprising a monitor as claimed in any one of the Claims 1 to 22, a variable optical attenuator upstream of the monitor and control means for controlling the attenuator including an input for setting the desired power and means for comparing the output from the monitor with the desired power input.

28. A control arrangement for providing constant optical attenuation in an optical fibre comprising a variable optical attenuator controlling the attenuation of the fibre, a first monitor as claimed in any one of the Claims 1 to 22 upstream of the attenuator, a second monitor as claimed in any one of the Claims 1 to 22 downstream of the attenuator and control means for controlling the attenuator including means for determining the attenuation in the fibre from the outputs of the two monitors, an input for setting the desired attenuation and means for comparing the determined attenuation with the desired attenuation and controlling the attenuator accordingly.

29. A multi-guide optical fibre circuit comprising a plurality of optical fibres having access regions formed therein for access to the evanescent field of the fibres, these regions being transversely aligned to form a substrate surface and an electroand/or optical circuit on the substrate surface with access to the evanescent field.

30. A circuit as claimed in Claim 29 wherein the surfaces of access regions are optically flat and lie substantially in the same plane.

31. A circuit as claimed in Claim 29 or 30 wherein the fibres are mounted in a plurality of parallel grooves in a block of material.

32. A circuit as claimed in Claim 31 wherein the block is silicon and the grooves are V-shaped and etched into one of the block.

33. A circuit as claimed in any of the Claims 29 to 32 wherein the electro- and/or optical circuit comprises a variable attenuator and a tap.

34. A method of making a multi-guide optical fibre circuit comprising forming an access region in each of a plurality of optical fibres, mounting the optical fibres in parallel with their access regions transversely aligned to provide a substrate surface and forming an electro-and/or optical circuit thereon.

35. A method according to Claim 34 wherein the surfaces of the access regions are formed optically flat and the fibres are mounted with the optical flats of the access regions lying in substantially the same plane.

36. A method according to Claim 34 or 35 wherein the method includes producing a plurality of parallel grooves in one surface of a block of material and positioning the fibres individually in the grooves.

37. A method according to Claim 36, wherein the block is made of silicon and the method also includes etching a plurality of V-shaped grooves therein.

38. A method according to any one of Claims 34 to 37, wherein the circuit

is made on the substrate surface by applying masking to the substrate surface removing the masking from regions of the substrate to be exposed and forming electrodes or attaching optical devices to the exposed regions.

39. A method according to Claim 38 wherein areas on which electrodes are to be mounted are exposed at a first time and the areas to which optical devices are to be attached are exposed at a second time.

40. A method according to Claim 39 wherein the said first time is later than said second time.

41. A method according to Claim 39 to 40, wherein the electrodes are the electrodes of a variable attenuator and the optical device is a tap.